

Todd W. King, P.E., BCEE

Chemical and Environmental Engineer

Education

M.S.E. - Environmental
Engineering, University of
Michigan, 2000

B.S.E. - Chemical Engineering,
University of Michigan, 1985

Registration

Professional Engineer:
Michigan, 1990

Certifications

Certified Underground Storage
Tank Professional: Michigan

Industrial Stormwater Operator:
Michigan

Construction Site Stormwater
Operator: Michigan

Mr. King is a chemical and environmental engineer with over 22 years experience in a variety of wastewater, air, and hazardous waste management projects for state, industry and municipalities. He has served in a full range of engineering roles from project manager to resident, design, and construction engineer for various municipal and private-sector environmental projects.

Currently, he is responsible for managing environmental services to clients in Michigan.

Water Quality

Officer-in-charge, National Wet Weather Demonstration Project. From 2004 to the present, Mr. King has been the officer-in-charge of the Rouge River Program. This \$500 million program, which is partially funded by USEPA, includes combined sewer overflow (CSO) control, stormwater management, wetlands restoration, and illicit connection control. In addition, the Rouge project includes extensive stakeholder participation through a network of subwatershed advisory groups, technical advisory groups, and a watershed-wide steering committee. The Rouge Project was awarded the American Academy of Environmental Engineer (AAEE) Superior Achievement Award in February 2002 – the top national honor for environmental engineering projects. In 2006, the Rouge River Project continues to contribute to professional knowledge in wet weather controls through technical publications, a popular website, Rougeriver.com, and wide distribution of annual water quality survey data.

Officer-in-charge, Rouge River *E. coli* Total Maximum Daily Load (TMDL) plan, Michigan. The Department of Environmental Quality (DEQ) received a grant from the USEPA to develop a plan to address *E. coli* in the Rouge River. The plan, known as a Total Maximum Daily Load (TMDL), will analyze data from the river to define sources and target areas for reductions with the goal

Experience Highlights

- Certified UST Professional
- Senior Project Manager
- Hazardous Waste Treatment

of meeting state water quality standards. The Rouge River has historically had levels of *E. coli* resulting from combined sewer overflows and nonpoint source pollution that make the water unsafe for body contact. The TMDL will focus on *E. coli* sources from the Rouge River Main, Upper, Middle, Lower, Bell, and Franklin Branches, and Evans Ditch. The DEQ has partnered with local organizations to determine *E. coli* sample locations and share data that will help identify the sources of contamination. Once the

sources have been identified, efforts will be focused on eliminating or reducing them. The TMDL process will involve stakeholder input, public meetings, and a public comment period. A draft document available for public comment in February 2007.

Project Manager, Source Water Protection Plan, Ira Township, Michigan.

As project manager, Mr. King authored the first Source Water Protection Plan

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Honors/Awards

Board Certified Environmental
Engineer (BCEE), American
Academy of Environmental
Engineers

approved by the Michigan Department of Environmental Quality in the State of Michigan. Modeled on the groundwater wellhead protection program, the plan seeks to protect the surface water intake for Ira Township on Lake St. Clair through a combination of stakeholder participation, public awareness, institutional and engineering controls, and emergency response communications. The plan has been made available by MDEQ on its website at http://www.michigan.gov/deq/0,1607,7-135-3313_3675_3693---,00.html for others to use as a model.

Contaminated Sediments/Rivers/Dams

Lead Practitioner, Sludge Lagoon Remediation and Technical Cost Assessment, Gary, Indiana. Mr. King is assisting a confidential client in Indiana in developing a polychlorinated biphenyls (PCB) remediation technical cost assessment (TCA) for a sludge lagoon. The lagoon occupies 18.5 acres on a 22-acre site that was originally used as a borrow pit for fill material during construction of a nearby interstate. Under a U.S. EPA Consent Decree, the client is required to address treatment and/or disposal of PCB-contaminated sludge currently contained in the sediments at the bottom of the lagoon. Mr. King is the lead practitioner providing technical leadership and oversight of the project. Tasks include data review and site survey, berm geotechnical investigation and physical assessment, detailed alternatives evaluation for berm improvements, a berm rehabilitation/replacement plan, wetlands impact assessment, regulatory analysis, cost estimates, preliminary design, preparation of consent decree treatment/disposal methods, a remediation TCA, and meetings with regulatory agencies and stakeholders.

Project Manager, PCB-Contaminated River Project. As project manager, Mr. King developed and tracked the scope, schedule and budget for a \$2 million per year project covering an 80-mile segment of the Kalamazoo River contaminated with PCBs. His responsibilities included sediment, water and biota sampling to support development of the Human and Ecological Risk Assessments as well as oversight of PRP conducted RI work. Mr. King established a comprehensive real-time field reporting procedure to provide the client complete daily summary reports by noon of the following data. He developed a comprehensive GIS and data management system to track field and lab results and prepare summary reports. He established a long-term monitoring program to characterize river and biota at various locations along the 80-mile site. In addition, Mr. King coordinated with the state and federal trustees (MDNR, MDEQ, NOAA, USFWS, USEPA) and USGS and the PRPs to determine sediment stability and the applicability of the PRP proposed sediment containment alternative. As project manager, Mr. King coordinated the development of EPA-approved Human Health and Ecological Risk assessments, coordinating detailed discussions between EPA and MDEQ toxicologists and scientists to translate differences in Part 201 and EPA Risk Assessment Guidelines to reach consensus on sediment and exposed soil clean up concentrations for PCBs. Finally, Mr. King oversaw evaluation of a PRP developed fate and transport model for a PCB contaminated river. He

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coordinated model review and critique, defined model scenarios, and organized presentation of the findings to MDEQ management.

Project Manager, Fate and Transport Model Evaluation Oversight. As project manager, Mr. King oversaw evaluation of a PRP developed fate and transport model for a PCB contaminated river. He coordinated model review and critique, defined model scenarios, and organized presentation of the findings to the client. He oversaw converting model input files from HEC-6 to HEC-RAS to facilitate easier review of flood flow scenarios with the user-friendly HEC-RAS interface.

Project Manager and Lead Design Engineer, Dam Repair, Kalamazoo River, Allegan County, Michigan. As project manager and lead design engineer, Mr. King prepared plans and specifications to repair three partially demolished dams to prevent continued deterioration. He provided services during construction to review shop drawings, oversee construction, prepare pay estimates, and provide conformance to design construction drawings. Currently, Mr. King is providing ongoing support to MDNR to maintain the dams and evaluate disposition alternatives in conjunction with USEPA and MDEQ decisions regarding the overall remedial decisions concerning the superfund site.

Project Manager, Preliminary Design and Construction Cost Estimates, Saginaw River, Michigan. As project manager, Mr. King prepared preliminary design and construction cost estimates to evaluate an environmental dredging project on behalf of the State of Michigan. He provided cost estimates to aid in evaluating PRP proposed settlement terms.

Remedial Investigations/Feasibility Studies/Risk Assessments/Remedial Design/Construction

Project Manager, Landfill RI. As project manager for remedial investigation (RI) of an abandoned landfill, Mr. King developed work, sampling and analysis, and quality assurance project plans for investigation which included vertical groundwater sampling with temporary well points, onsite field GC analyses of volatile organic, and installation of well nests around the perimeter to evaluate groundwater and contaminant transport.

Project Manager, RI/FS. Mr. King was project manager for an RI and feasibility study (FS) of a former used oil storage and transport facility. He developed work, sampling and analysis, and quality assurance project plans for investigation, which included vertical groundwater sampling with screened HSA, a Geo-probe groundwater and soil gas survey, and onsite field gas chromatography (GC) analyses of volatile organic. He conducted step and constant rate aquifer performance testing, slug-testing and passive free product recovery. In addition, he installed a double cased monitoring well into the underlying aquifer, and prepared a focused feasibility study to evaluate contaminated soil and groundwater remedial alternatives.

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Project Manager, RI. Mr. King was project manager for an RI to investigate potential impact of a paper waste National Priorities List (NPL) site to an adjacent lake. He developed work, sampling and analysis, and quality assurance project plans that included aerial and satellite image processing, underwater video and water quality reconnaissance, sediment collection with pore-water extraction to evaluate toxicity and chemical characterization, installation of temporary monitoring wells at shallow and deep elevations to evaluate water quality and static water elevations in the sub-lacustrine formations, and benthic sampling to evaluate impacted biota.

Project Manager, Potentially Responsible Party Oversight. As project manager, Mr. King performed oversight of potentially responsible party's (PRP's) work products for a multi-plume, multi-aquifer 1,4-dioxane plume that covers several square miles. The PRP submittals included remedial investigations, feasibility studies, remedial design/corrective action, operation and maintenance plans, and effectiveness monitoring plans.

Security/Vulnerability Assessments

Officer-in-charge, Water System Security Exercises. The State of Michigan contracted with CDM to develop and conduct tabletop exercises for 30 public water and wastewater systems throughout the state. Each exercise presented several site-specific scenarios to simulate an emergency situation. The decision-making level personnel (water system superintendents, DPW director, city engineer, police and fire incident commanders, etc.) implement emergency response procedures and discuss roles, responsibilities and procedures. After each scenario, CDM facilitated a discussion of potential improvements for each representative's agency to consider for implementation.

Officer-in-charge, Hazardous Chemical Risk and Vulnerability Assessment Training. The Michigan Homeland Security Protection Board contracted CDM (in association with the Michigan Rural Water Association) to conduct risk and vulnerability awareness seminars for the approximately 5,000 facilities regulated by SARA Title III in Michigan. The one-day seminar was focused on introducing risk terminology and methodology so that each facility can assess and improve on their vulnerabilities.

Officer-in-charge, Vulnerability Assessment and Emergency Response Plan Training. The State of Michigan was authorized to provide security technical assistance and training to public water systems serving less than 100,000 persons under the Department of Defense and Emergency Supplemental Appropriations for Recovery from and Response to Terrorist Attacks on the United States Act (PL 107-117), the Federal Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188), and the amendments to the Federal Safe Drinking Water Act (PL 104-182, Section 1433). Over a three-year period, CDM (1) developed one- and two-day training seminars to aid covered water supply systems in completing a vulnerability assessment and emergency response plan; (2)

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provided over 30 training sessions throughout the state to target water supply systems; and (3) provided on-site assistance to selected systems as directed by the Michigan Department of Environmental Quality.

Brownfield Redevelopment

Project Manager, Aurelius Landfill Evaluation/Hope Soccer Field, Lansing, Michigan. As project manager, Mr. King oversaw the investigation, interim improvements, design, and construction for a six-field competition class soccer complex above the former Aurelius Road Landfill. This innovative brownfield project involved fast-track negotiations with MDEQ, Ingham County, and City of Lansing staff and political officials to improve and re-shape the former landfill cap with the installation of a passive/active gas venting/flare system, structural foundation support for a building in the center of the landfill, irrigation and drainage systems for the athletic fields, and Part 201 compliance for potential environmental risks. This project resulted in the re-use of an abandoned landfill site, the sale of valuable City-owned property that was the original site for the complex for commercial use, and creation of prized community asset.

Hazardous Waste Treatment

Project Manager, Pump and Treat System Operation. Mr. King was project manager responsible for operating an on-going pump and treat system for a groundwater trichloroethene plume. His responsibilities included testing, reporting, sampling, monitoring and maintenance of the purge system, monitoring well network, air stripper treatment system, and outfall discharge under the National Pollutant Discharge Elimination System (NPDES) permit. Reporting requirements included air permit, NPDES permit, and the consent order stipulated monthly, quarterly, and annual summaries and evaluations.

Project Engineer, RCRA Part B Application Preparation. As project engineer, Mr. King was responsible for preparing RCRA Part B applications for processes to treat solid, hazardous, liquid and sludge wastes utilizing chemical fixation/stabilization, precipitation, sedimentation, filtration, dewatering, centrifugation, thinfilm evaporation and membrane filtration.

Site Manager, Remediation Evaluation and Design. Mr. King was site manager in charge of evaluation and design of remediation of a solvent contaminated site impacting unsaturated soil and groundwater. He designed the multiple well groundwater pump and treat system with a granular activated carbon treatment system.

Project Engineer, Plans and Specifications for Dam Repair. As project engineer, Mr. King was responsible for coordinating plans and preparing specifications for a dam repair as part of a \$7 million polychlorinated biphenyls (PCB) contaminated surface impoundment along the Rouge River in Southeastern Michigan.

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Industrial Treatment

Project Engineer, Water Balance and Waste Source Characterization

Development. As project manager, Mr. King developed a water balance and waste source characterization for a specialty chemical manufacturer in western Michigan. Part of the follow-on work included evaluating the existing activated sludge pretreatment system at the facility. Through recommended operational modifications, the client was able to meet pre-treatment standards without instituting a proposed \$1.4 million capital improvement project. By instituting the recommended source treatment scheme, the client is realizing an increase in wastewater treatment capacity at a fraction of the original capital previously estimated.

Project Manager, Autotrophic Aerobic Biological Treatment System

Pilot Study. As project manager, Mr. King conducted a three-month pilot study of an autotrophic aerobic biological treatment system. The study was conducted to demonstrate the effectiveness of the patented system on a high strength, high salt content pharmaceutical waste.

Project Engineer, Aerobic Biological Leachate Treatment System

Evaluation. As a project engineer, Mr. King evaluated an aerobic biological leachate treatment system and developed a guidance document for the addition of potentially toxic organic waste streams to the system while maintaining an active bio-mass.

Staff Engineer, Construction Management and Startup. Mr. King was staff engineer in charge of reviewing and coordinating construction and drawing review for a wastewater pretreatment facility treating leachate from a hazardous waste landfill. He was also responsible for start-up and construction management.

Project Engineer, Wastewater Treatment Facility Evaluation. As project engineer, he was in charge of evaluating an existing oily wastewater treatment facility. He developed preliminary design after performing an economic analysis of promising treatment alternatives.

Project Engineer, Retrofit and Expansion Design. Mr. King was project engineer for design of retrofit and expansion of an existing oily wastewater treatment system. The system included four dissolved air flotation units and chemical addition.

Solid Waste

Design Engineer, Landfill Flare Project Coordination. Mr. King was design engineer responsible for coordinating design, plans, specifications and bid packages in conjunction with the owner for a 1,000 cfm landfill flare project. He coordinated the electrical, structural and process design with the owner and pre-purchased equipment from suppliers.

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Design Engineer, Hydraulic Evaluation. As design engineer, he was responsible for hydraulic evaluation of a multiple cell hazardous/non-hazardous leachate collection system.

Phase I and Phase II ESAs

Project Manager, ESAs. As a project manager, Mr. King has conducted numerous Phase I and Phase II environmental site assessments (ESAs) for commercial and industrial properties. He is knowledgeable with the Part 201 Rules for Michigan Act 451 of 1994, as amended. Specifically, he has prepared and executed Phase II investigations to meet the requirements of the baseline environmental assessments (BEAs) recently instituted in Michigan, which provide additional measures for buyer protection of contaminated properties.

Municipal Wastewater Treatment/Disposal

Resident Engineer, Municipal WWTP. Mr. King is resident engineer for a 1.5-mgd sequencing batch reactor (SBR) municipal wastewater treatment plant (WWTP). The unit processes include mechanical fine screening, grit removal, computer controlled three tank SBR secondary treatment unit, and ultraviolet (UV) disinfection. Waste activated sludge is concentrated in a rotary drum concentrator and aerobically digested.

Staff Engineer, Off -Gas Testing. As staff engineer, Mr. King is responsible for off-gas testing of fine bubble diffuser manufacturers to determine design parameters for retrofit of the 35-mgd WWTP.

Project Engineer, Advanced Wastewater Treatment Production

Demonstration. Mr. King was project engineer in charge of a demonstration project involving advanced treatment of wastewater and production of high-quality fertilizer utilizing ion exchange. His responsibilities included organizing and coordinating shipping and start-up of the pilot plant from Italy; daily operation and laboratory analysis; evaluating and summarizing data; plus verbal and written technical presentation of results.

Design Engineer, WWTP Upgrade. Mr. King was design engineer for upgrading a 450,000-gallon-per-day trickling filter wastewater treatment plant. His responsibilities included evaluating hydraulic and biological considerations for the trickling filter, clarifiers and pumps.

Underground Storage Tanks

Certified Underground Storage Tank Professional, Wayne County, Kalamazoo County, Ingham County, Oakland County, Michigan. As a Certified UST Professional, Mr. King has conducted numerous UST removals, sampling, spill response, remedial actions and closures for various public and private sector clients. Significant projects include the removal, investigation, reporting and closure of 22 USTs at Willow Run Airport and 8 USTs at Metro Airport on behalf of Wayne County; removal and closure of

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one UST for the City of Lansing; and removal, closure and replacement with an AST in Southfield, Michigan.

Project Manager, UST Removal and Remediation, Troy, Michigan.

Mr. King was project manager responsible for turnkey removal and remediation of three 30,000-gallon fuel oil underground storage tanks (USTs) for an office building. He completed removal and corrective action in less than one week.

Project Engineer, Aboveground Storage Tank Upgrade Design.

Mr. King was project engineer for design of an aboveground and underground storage tank upgrade for flammable liquids. The underground fuel system included an automatic monitoring leak detection system in accordance with the latest EPA and State of Michigan Fire Marshall codes.

Staff Engineer, UST Removal and Installation Coordination. As staff engineer, Mr. King was responsible for coordinating plans and specifications for an UST removal and installation project. He developed guidelines for sequence of construction and proper safety and testing procedures.

Air Pollution Control/Title V Emission Inventories

Project Manager, Title V Air Emissions Inventory. As project manager, Mr. King prepared a complete Title V Air Emissions Inventory for a Research and Development facility for a Big Three automobile manufacturer. As part of this project, he developed a Microsoft FoxPro based database for collecting source information, calculating actual and potential emissions, and providing emission summary reports for the client in order to evaluate additional permit limits for "synthetic minor" status.

Project Manager, Sludge Incinerator Evaluation. As project manager, Mr. King prepared an evaluation of a municipal wastewater multiple hearth sludge incinerator with respect to actual and potential emissions. Through the course of this project, he assisted the client in evaluating sludge production at the facility, developed an empirical model to predict future sludge production calibrated to historical data, conducted EPA protocol stack testing to develop site specific emission factors, and provided support in regulatory negotiations to attain "synthetic minor" status.

Project Engineer, Air Emissions Inventory. As a project engineer, Mr. King performed air emissions inventory for an automobile coating manufacturer. He calculated emission factors based on batch reactor raw materials, throughput and filling operations; and developed site-specific emission factors based on EPA protocol stack testing for VOCs. In addition, he compiled an emission factor database for a large breakfast foods manufacturer, analyzed process parameters to develop emission source categories and related factors, and calculated hazardous air pollutant emission quantities for various raw material feed scenarios for a cement kiln facility.

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Stormwater

Officer-in-charge, Hazard Mitigation Grant Program. Under contract to the Michigan State Police, Emergency Management Division, Mr. King assisted the State of Michigan to develop home elevation projects under a grant from the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program. Under this program, the project team developed a marketing plan, conducted public meetings, met with homeowners and developed home owner applications to assist the State in processing the grant monies under the FEMA program to reduce the cost of repetitive loss claims.

Professional Activities

American Academy of Environmental Engineers

Water Environment Federation/Michigan Water Environment Association

American Water Works Association

American Institute of Chemical Engineers - Environmental Division

Michigan/National Society of Professional Engineers

Publications

"Horizontal Directional Drilling with Ductile Iron/HDPE Pipe." Distribution Systems Symposium, American Water Works Association, Cleveland Ohio, September 23-26, 2007 (S. Chowdhury, T. King, J. Jones, M. Barnes)

"Development of PCB clean-up levels to protect ecological receptors along the Kalamazoo River, USA." Proceedings of an International Conference-Protection and Restoration of the Environment VIII, Chania, Greece, July 3-7, 2006 (R. French, T. King).

"Integrating Statistical Uncertainty into Cost Benefit Analysis of Remedial Alternatives," Fall 2002 Sponsor Conference, Sediment Management Work Group, Wilmington, Delaware, October 8, 2002, (T. King, J.W. Kern).

"Integrating Statistical Uncertainty into the Cost Benefit Analysis of Remedial Alternatives." Presented at Annual Meeting of the Society of Environmental Toxicology and Chemistry, Baltimore, Maryland, November 2001 (J. W. Kern, T. King, R. French, et. al.).

"Comparative In-Waste Performance Testing of Fine Pore Membranes for Aeration System Design." Presented at 63rd Annual WPCF National Conference, Washington, D.C., 1990 (with T.A. Allbaugh and F.G. Porta).

"Nutrient Removal and Recovery from Municipal Wastewater by Selective Ion Exchange," Proceedings of Water Reuse Symposium IV, Denver, Colorado, August 27, 1987 (with S.J. Kang and A. Lopez et. al.).